

Meetings

Yeast Genetics Conference

An informal conference on yeast genetics and related biochemical problems was held at the Laboratoire de Génétique Physiologique, Centre National de la Recherche Scientifique Gif-sur-Yvette, from 30 to 31 August 1963.

Fifty-four investigators from 12 countries participated. There was no formal presentation of papers, but four general areas were discussed: cytoplasmic inheritance, recombination, complementation, and gene-enzyme relations. The discussions were focused on the most recent findings in each field, mostly unpublished. Individuals spoke about their research, and there was discussion from the floor.

Recent developments in the problem of cytoplasmic petites (respiration-deficient mutants) were summarized (Slonimski), and new data on induction procedures (Lacroute), data on complementation of petites (Jakob), and problems and data on electron microscopy of cells deficient in respiratory enzymes were discussed (Lindgren, Morpurgo, Yotsuyanagi); also, biochemical aspects of the petite problem were presented (Parks). Two new instances of gene-cytoplasmic interaction were discussed. In one case the contributing factors have an effect on growth rate (James); in the other, the cytoplasmic agent in yeast is a filtrable, infective, killer factor (Bevan). Developments in the problem of somatic recombination (Roman) and new procedures for studying the kinetics of this problem (Luzzati) were discussed. Evidence was presented for the association of spontaneous mutations with recombination (Magni). Complementation in adenine loci in *Schizosaccharomyces pombe* (Leupold, Gutz) and in *Saccharomyces* (Woods, Bevan) was fully treated. The session on gene-enzyme relations began with a discussion of supersuppressors and presentation of the first evidence of an operon in yeast (Hawthorne). The effect of purine analogs on adenine mutants (Clarke) and the biochemical nature of glutamic acid-dependent mutants (Ogur) were discussed. Synthesis of

cytochrome *c* was analyzed from a genetic and biochemical point of view; the problem of amino acid sequence and the relation between gene dosage and enzyme production were considered (Sherman, Slonimski).

A good deal of time was devoted to the description and detailed discussion of the procedures in different laboratories (Drysdale, Fowell, Marcovich, Williamson). The list of standard mutants available in *Saccharomyces* and *Schizosaccharomyces pombe* was brought up to date with the inclusion of the latest findings on genetic metabolic blocks and the enzymes involved (Robichon-Szulmajster, Slonimski, Lacroute, Klopotoski, Drysdale, Wiame, Parks, Ogur). Other participants in the discussions were Bulder, Cox, Eddy, Emeis, Fukuhara, Galzy, Gilliland, Grenson, Haefner, Heslot, Hottinguer, Houssaye, Johnston, Laskowski, Meuris, Middelhoven, Moustacchi, Newman, Oppenoorth, Oshima, Pere, Prevost, Sels, Scheda, Yuasa, and Zelickson.

Almost the entire spectrum of yeast genetic research was surveyed in 2 days. The meeting demonstrated the great quantity of information that can be exchanged in a short time when a single organism is the focus of discussion. Moreover, it became clear that in yeast the techniques now available allow analysis at the fine-structural level of genes and make possible investigation of structure and function at the molecular level.

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Geodesy and Geophysics

The 13th General Assembly of the International Union of Geodesy and Geophysics (IUGG) was held from 19 to 31 August 1963 on the Berkeley campus of the University of California. The focus of interest, at least for solid-earth scientists, was the earth's upper mantle. This interest was due in part to the fact that many organizational aspects of the current International Up-

per Mantle Project, first proposed in 1960 by IUGG president V. V. Belousov, fall under the auspices of the IUGG. Contributors to the 5-day symposium on the upper mantle were from many disciplines.

Bullard (England) summarized world-wide heat-flow measurements. The total number of such measurements, to date, is less than 1000. We now have more heat-flow measurements for the sea than for the land; the reverse was true in 1960. Bullard attempted to explain anomalously high heat flow beneath mid-ocean ridges as a result of narrow rising convection currents in the mantle. Lubimova (U.S.S.R.) reported, for stable shield areas, values for heat flow that were 30 percent lower than the world-wide average. The areas of lower-than-average heat flow corresponded with areas of higher-than-average shear velocity in the upper mantle.

The theory of continental drift is enjoying an upswing in popularity among some geophysicists. Evidence in support of the theory comes primarily from the fields of paleomagnetism (Runcorn, England) and geology (Wilson, Canada). The curves for polar wandering, as determined from paleomagnetic data for each of the continents, show a wide divergence, which may be explained by shifting of the continents. The absence of old rocks on oceanic islands and the configuration of certain submarine ridges is cited as additional supporting evidence.

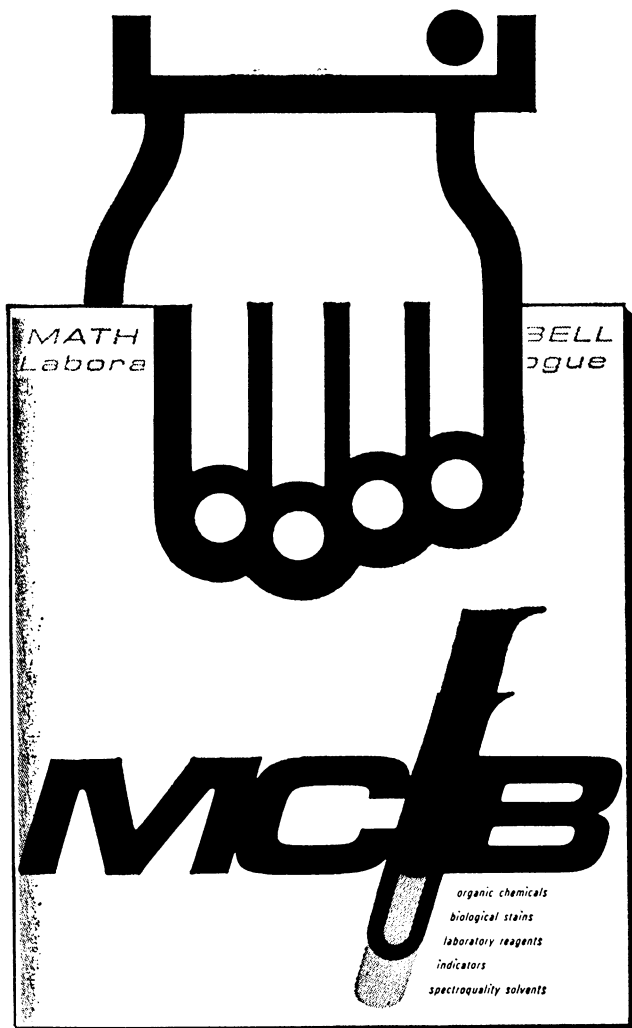
An important new kind of evidence concerning the history of the ocean floor is now becoming available through the use of the sub-bottom depth profiler (Ewing, Talwani, United States). This instrument produces a continuous section beneath the ship's track, providing information on water depths, the thicknesses and configuration of various strata of sediments, and the surface of the first hard-rock layer. Only a few transoceanic profiles have been obtained, but the results suggest that the total accumulation of sediments is remarkably small, that portions of the ridges are virtually bare of sediments, and that the basement surface is almost uniformly rough. It appears that this new type of data might prove or disprove, in the near future, the theory of continental drift.

Some years ago it was generally assumed that lateral variations within the upper mantle were nonexistent or negligible. Now, observations of a number of types demonstrate quite conclusively

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that, at least for certain parameters, this is not the case. The observations include those of gravity (Woollard, United States), earth tides (Pariisky, U.S.S.R.), heat flow (Lubimova, U.S.S.R.), and seismology (Pakiser, United States; Tryggvason, Iceland; Anderson, United States; Brune, United States; Tarakanov, U.S.S.R.). Broadly speaking, it appears that lateral variations in the elastic parameters and density of the upper mantle of the order of 5 percent over distances of a few hundred kilometers or less are required to satisfy the observations. The depth to which such variations are detectable is not yet known.

Several groups are studying magnetic variations. Observations of magnetic disturbances with arrays of instruments have illustrated that there are many relatively local and probably subcrustal areas with unusually high electrical conductivity. Several papers indicated that there are such effects in ocean areas, not related to the conductivity of sea water. It is still not clear how, or if, certain of these features are related to the American mid-continent gravity high, to areas of anomalous heat flow, or to large-scale magnetic anomalies.

There is renewed interest in the quiet-solar variation and its variability. Interest in investigations of rapid magnetic variations is still growing. This was evidenced by the large number of extra sessions on that subject. Papers were presented on magnetic conjugate points and observations near the magnetic equator. Plans for the World Magnetic Survey have been endorsed by a number of national groups, and this survey promises to be a highly successful undertaking.

Bullen (Australia), using new data obtained by Bolt (United States) on the structure of the earth's core, showed that the earth's central density could be as low as 15 grams per cubic centimeter, and that the degree of inhomogeneity within the inner core is low.

Crustal exploration by the seismic refraction method or by surface-wave methods has now been carried out for large portions of the earth; in most cases, crust-mantle models can be found which are compatible with these data and with those obtained by other geophysical techniques. Both seismic methods still lack good resolution for exploring the deeper portions of the crust. Comparison of results obtained with the two techniques is sometimes hampered by the fact that shear velocities are not normally reported in refraction

studies; it is these velocities that are the most important in surface-wave studies.

Uffen (Canada) proposed a qualitative hypothesis relating the radiation-shielding effect provided by the earth's magnetic field to certain features of life on earth. As a result of the thermal history of the earth, the field did not exist in the earlier stages, nor did life. Later, near times of field reversal, intense radiation would have strongly increased the rate of mutation in living organisms.

Stichov (U.S.S.R.) demonstrated the existence of a high-density form of silica, thus providing a possible explanation for the high densities observed in the lower mantle.

Some confirmation of the resonance effect between earth tides and the diurnal nutation of the earth was presented by Pariisky (U.S.S.R.). His results are based on the analysis of two long series of tidal-gravity observations at Tashkent (64-month analysis) and Frunze (39-month analysis).

Vinogradov (U.S.S.R.) claims that stony meteorite matter at atmospheric pressure under repeated heating at a temperature of 1500°C actually separates into basaltic and dunite matter. Further experimental verification, especially at high pressure and temperature, accompanied by careful petrographic analysis may lead to the solution of some fundamental problems concerning the origin and formation of the earth.

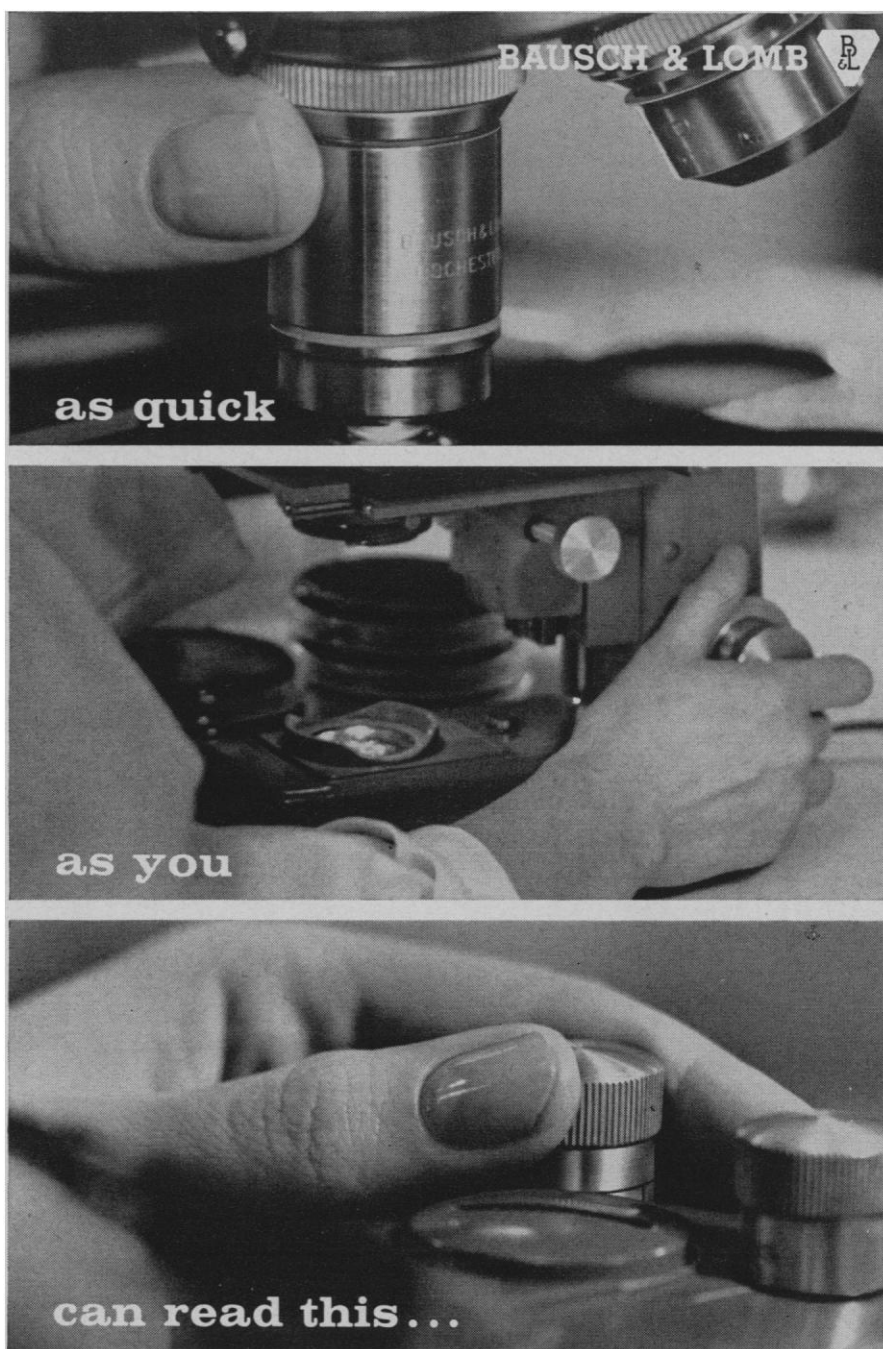
Some papers were given on the deep-drilling programs in the United States and the U.S.S.R. The order of priority in the Soviet program is as follows: (i) deep depressions of platform and geosynclinal areas (the North-Caspian depression, or oil- and gas-bearing areas of Azerbaidzhan); (ii) Paleozoic geosynclines (the Urals, or Central Kazakhstan); (iii) ancient shields (Karolia or the Ukraine); (iv) crustal regions of the transitional type (Transcaucasus or Black Sea); (v) regions of the island areas and of the crust close to the oceanic type (southern Kurile Islands or Southern Sakalin). This order of priority is very different from that of the United States, where all effort is being focused on an attempt to drill to the Mohorovicic discontinuity, beneath the ocean.

About 2000 scientists from 60 countries attended the assembly.

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20 DECEMBER 1963



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